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101 Ways to Try to Grow Arabidopsis: Did Use of Slow Release Fertilizer Result in Healthy Plants?

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Purdue Methods:



Did use of slow release fertilizer result in healthy plants?

Short answer:

Yes

Results:

Use of 14-14-14 slow release fertilizer, incorporated into the root medium prior to planting, resulted in good plant growth. At a rate of 1.4 grams/ 3" square pot (3.6 kg/m³)--2X the recommended rate for low-use plants—the *Arabidopsis* plants were larger and greener in both early and late stage of vegetative growth.

Analysis of soilless mix taken in late stage of vegetative growth indicated that this slow release formulation improved soil pH (6.9) over plants irrigated alternatively with fertilizer solution and clear water (7.6). Clear water at our facility is highly alkaline (250-300 ppm CaCO₃) and has pH of 7.5 or above, so this soil pH benefit from slow release fertilizer use may not be realized at facilities with better water quality.

Though slow release fertilizer was effective in this study, a subsequent study showed that slow release fertilizer was not effective in a fast-production system using a 24-hour photoperiod.

Discussion:

Effect on flowering and seed production was not studied. However, we observed a 5-7 day delay in flowering in one study on plants with slow release incorporated, as compared to plants grown with liquid fertilizer and no slow release fertilizer (Figure 3). This was in a study conducted in the greenhouse during high light season. It begs the question whether some of the wispy, stress-induced flowering of summer greenhouse-grown *Arabidopsis* could be overcome with a change in fertilization. Further study is needed in this area.



Figure 1. Plants grown using 14-14-14 slow-release fertilizer (top row) versus plants grown with standard liquid fertilizer solution.



Figure 2. Plants grown with a standard liquid fertilizer solution (bottom row) versus increasing rates of pre-plant incorporated 14-14-14 slow-release fertilizer. The slow-release treatments did not receive any liquid fertilizer. Note the deficiency symptoms of the lowest rates.



Figure 3. Plants grown using 14-14-14 slow-release fertilizer (right) versus plants grown with standard liquid fertilizer solution.